Claims

1. Confocal imaging equipment in particular for endoscope comprising an image guide (1) constituted by flexible optical fibres with:

- on the side of the proximal end of the image guide (1): a source (2) producing an illumination beam, means for angular scanning (3) of said beam, means for injecting (4) the beam deflected alternately into one of the fibres of the image guide (1), means for separating (5) the illumination beam and the backscattered signal, means for spatial filtering (6), means for detecting (7) said signal, electronic means (8) for controlling, analyzing and digital processing of the detected signal and for displaying; and

- on the side of the distal end of the image guide (1): an optical head (9) adapted for focussing the illumination beam coming out of the illuminated fibre, characterized in that the means for angular scanning (3) comprise a resonating line mirror (M1) and a galvanometric frame mirror (M2) with a variable frequency and two afocal optical systems adapted for conjugating first the two mirrors (M1, M2) then for conjugating the frame mirror (M2) and the injection means (4) in the image guide, each optical system respecting the initial quality of the wave front (WFE) and having a spatial distribution of the focal spot intensity (PSF) equal to the diameter of a fibre core.

2. Equipment according to claim 1, characterized by an afocal optical system comprising standard lenses and corrective lenses adapted for correcting the residual aberrations of said standard lenses.

3. Equipment according to claim 2, characterized in that the afocal optical system comprises four lenses (L1-L4; L5-L8) a corrective doublet (L2, L3; L6, L7) of which is placed symmetrically relative to the image plane

allowing correction of the curvature of field and minimization of the wave front error.

4. Equipment according to claim 1, characterized by a custom-made afocal optical system.

5. Equipment according to one of the preceding claims, characterized in that the injection means (4) comprise a set of lenses (L10) adapted for converting the angular scanning to translational scanning of the image guide and upstream a doublet (L9) adapted for correcting the residual curvature of field of said set of lenses (L10).

6. Equipment according to claim 5, characterized in that said set of lenses (L10) is a triplet.

7. Equipment according to one of the preceding claims, characterized in that it comprises a glass plate arranged at the image guide input intended to reject the parasitic reflections outside the filtering means (6).

8. Equipment according to one of the preceding claims, characterized in that it comprises a glass plate arranged at the image guide output intended to reject the parasitic reflections outside the illuminated optical fibre.

9. Equipment according to one of the preceding claims, characterized in that the line mirror (M1) is a mirror resonating at a frequency of 4 kHz.

10. Equipment according to any one of the preceding claims, characterized in that the frame mirror (M2) has a variable frequency between 0 and 300 Hz.

11. Equipment according to any one of the preceding claims, characterized in that the electronic means (8) for controlling, analyzing and digital processing of the detected signal and display comprise a synchronization card (21) adapted in particular for controlling in a synchronized manner the movement of the line mirror (M1) and frame mirror (M2) and adapted to know at any moment the position of the scanned illumination beam.